

Dynamical properties of the Molniya satellite constellation: long-term evolution of orbital eccentricity

Elisa Maria Alessi^{(1,2)*}, Alberto Buzzoni⁽³⁾, Jérôme Daquin⁽⁴⁾, Albino Carbognani⁽³⁾ & Giacomo Tommei^{(5)*}

⁽¹⁾*IMATI-CNR, Istituto di Matematica Applicata e Tecnologie Informatiche “E. Magenes”, Via Alfonso Corti 12, 20133 Milano, Italy*

⁽²⁾*IFAC-CNR, Istituto di Fisica Applicata “N. Carrara”, Via Madonna del Piano 10, 50019 Sesto Fiorentino (FI), Italy*

⁽³⁾*INAF-OAS, Osservatorio di Astrofisica e Scienza dello Spazio, Via P. Gobetti 93/3 40129 Bologna, Italy*

⁽⁴⁾*naXys, Department of Mathematics, University of Namur, 8 rempart de la Vierge, 5000 Namur, Belgium*

⁽⁵⁾*Università di Pisa, Dipartimento di Matematica, Largo B. Pontecorvo 5, 56127 Pisa, Italy*

SUPPLEMENTARY MATERIAL 1

In the following figures, we show the semi-major axis (left; km), eccentricity (middle) and pericenter altitude (right; km) mean evolution from the TLE data of the satellites reported in Tab. 1 of the main paper. On the right, the time is displayed in decimal year for the sake of clarity. The black horizontal line on the right plot highlights 250 km of altitude.

In Fig. 1, orbits #1-6 are reported (top to bottom).
In Fig. 2, torbits #7-12 are reported (top to bottom).
In Fig. 3, orbits #13-18 are reported (top to bottom).
In Fig. 4, orbits #19-24 are reported (top to bottom).
In Fig. 5, orbits #25-30 are reported (top to bottom).
In Fig. 6, orbits #31-36 are reported (top to bottom).
In Fig. 7, orbits #37-42 are reported (top to bottom).

*Corresponding author

Email address: elisamaria.alessi@cnr.it (Elisa Maria Alessi^(1,2))

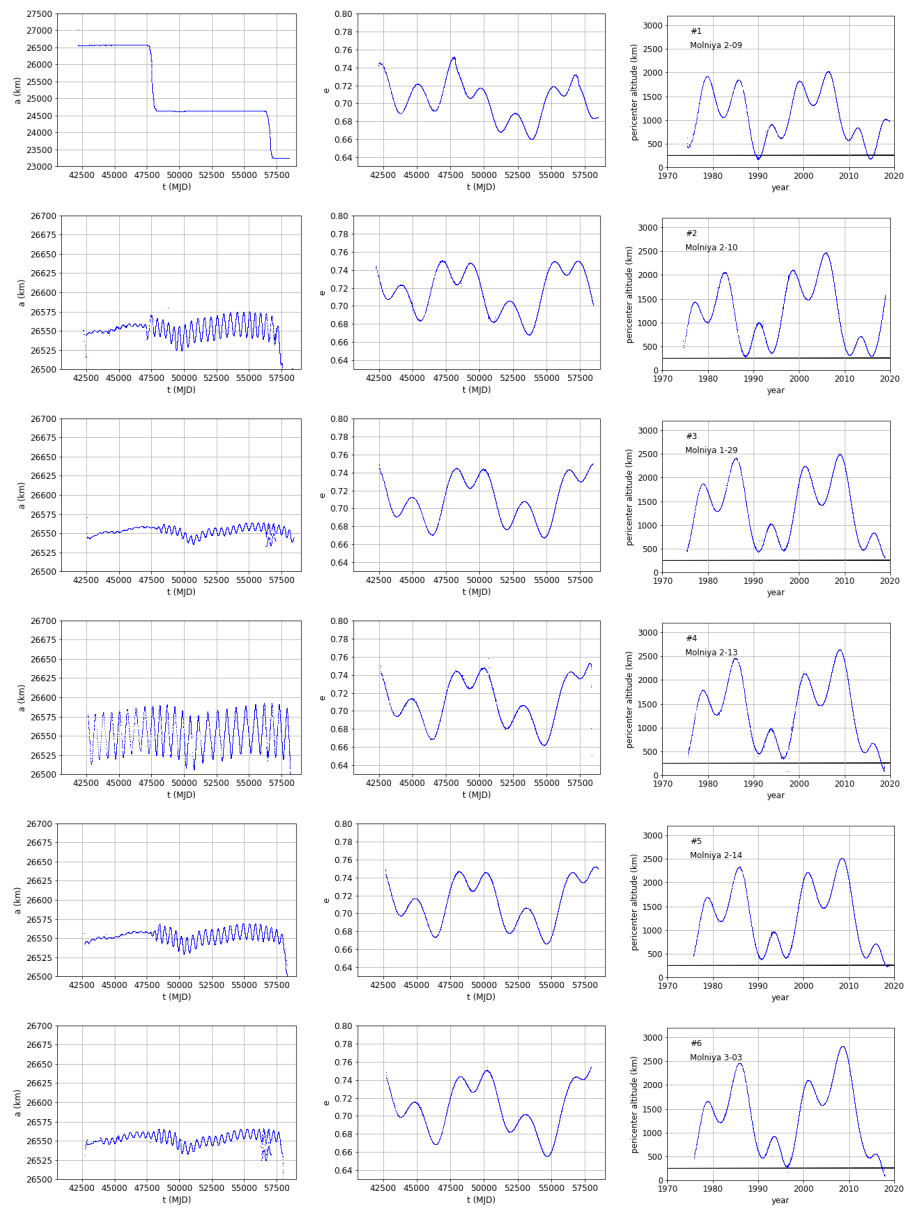


Figure 1

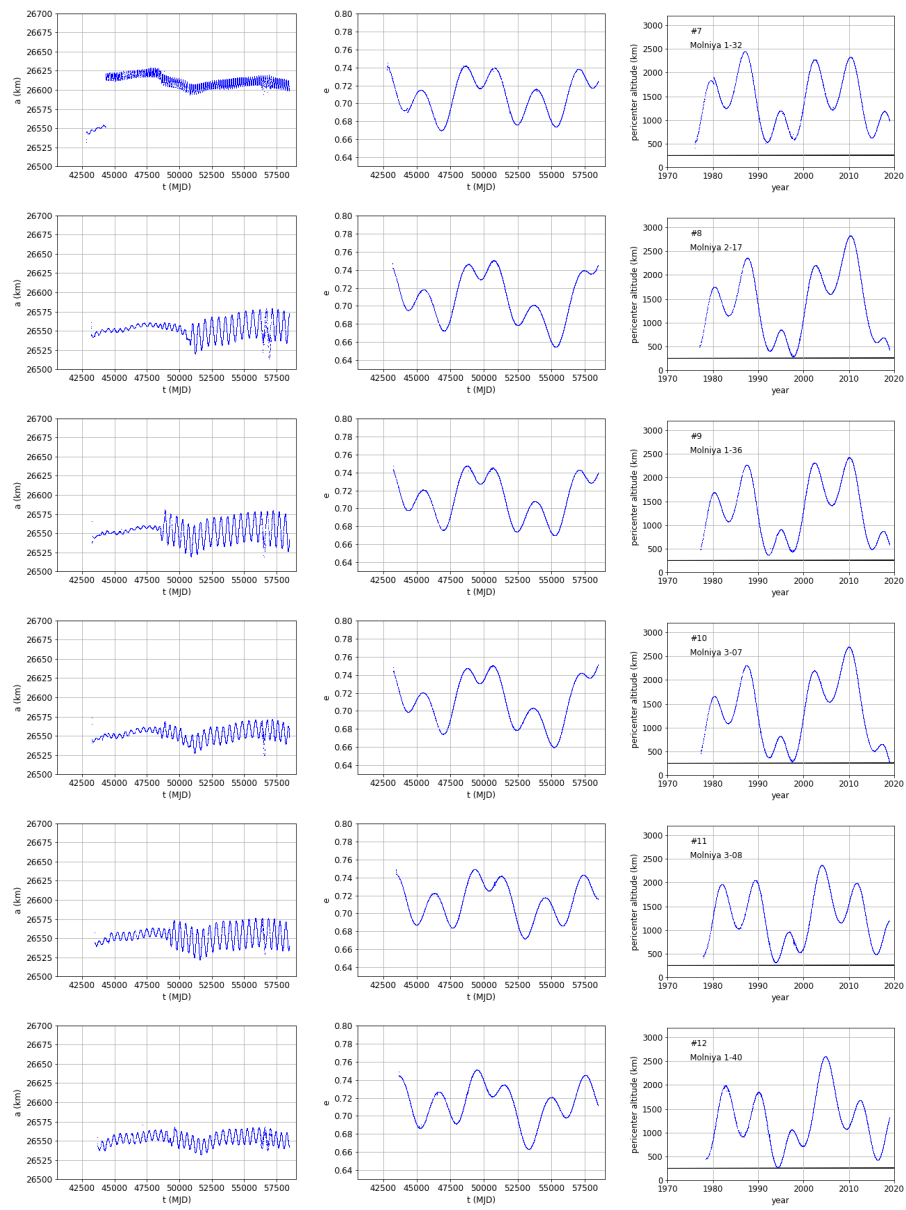


Figure 2

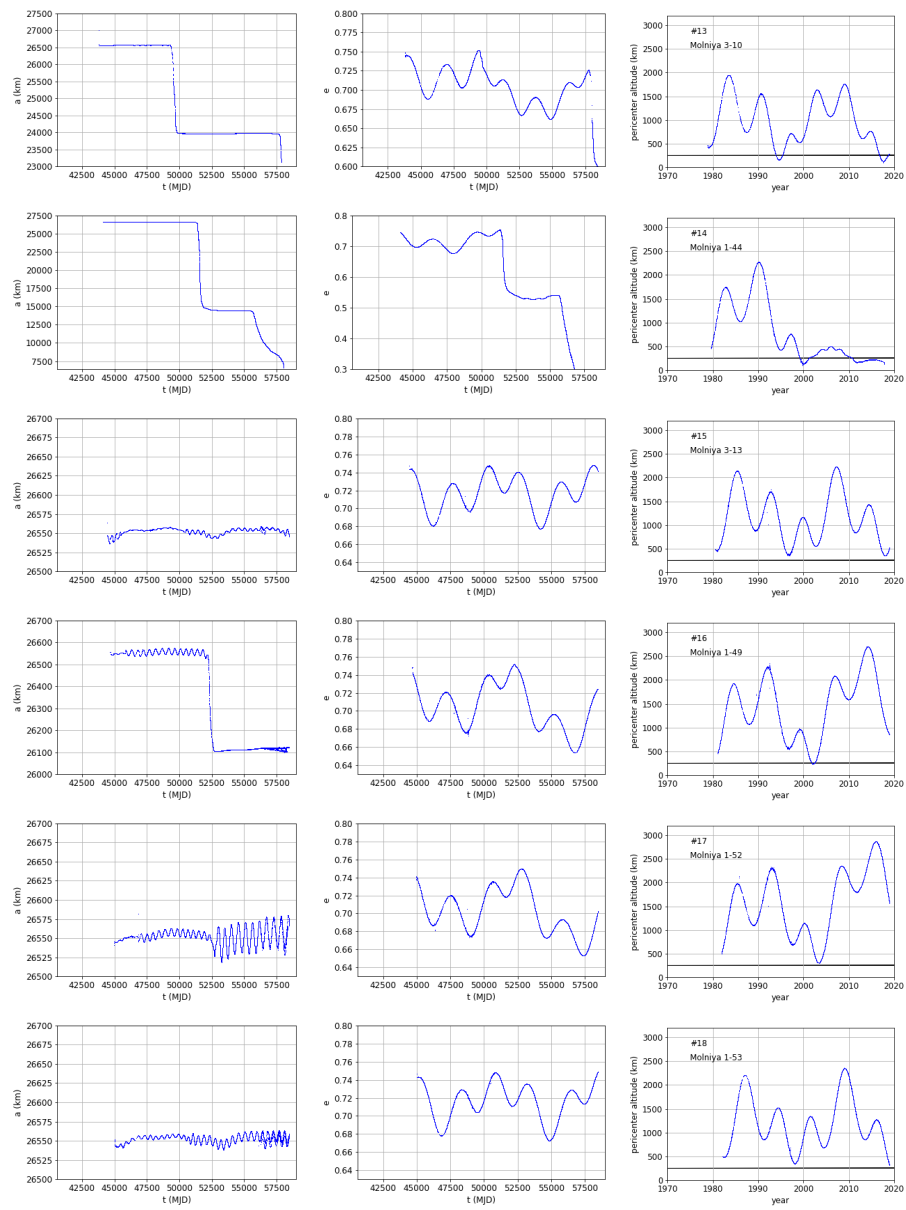


Figure 3

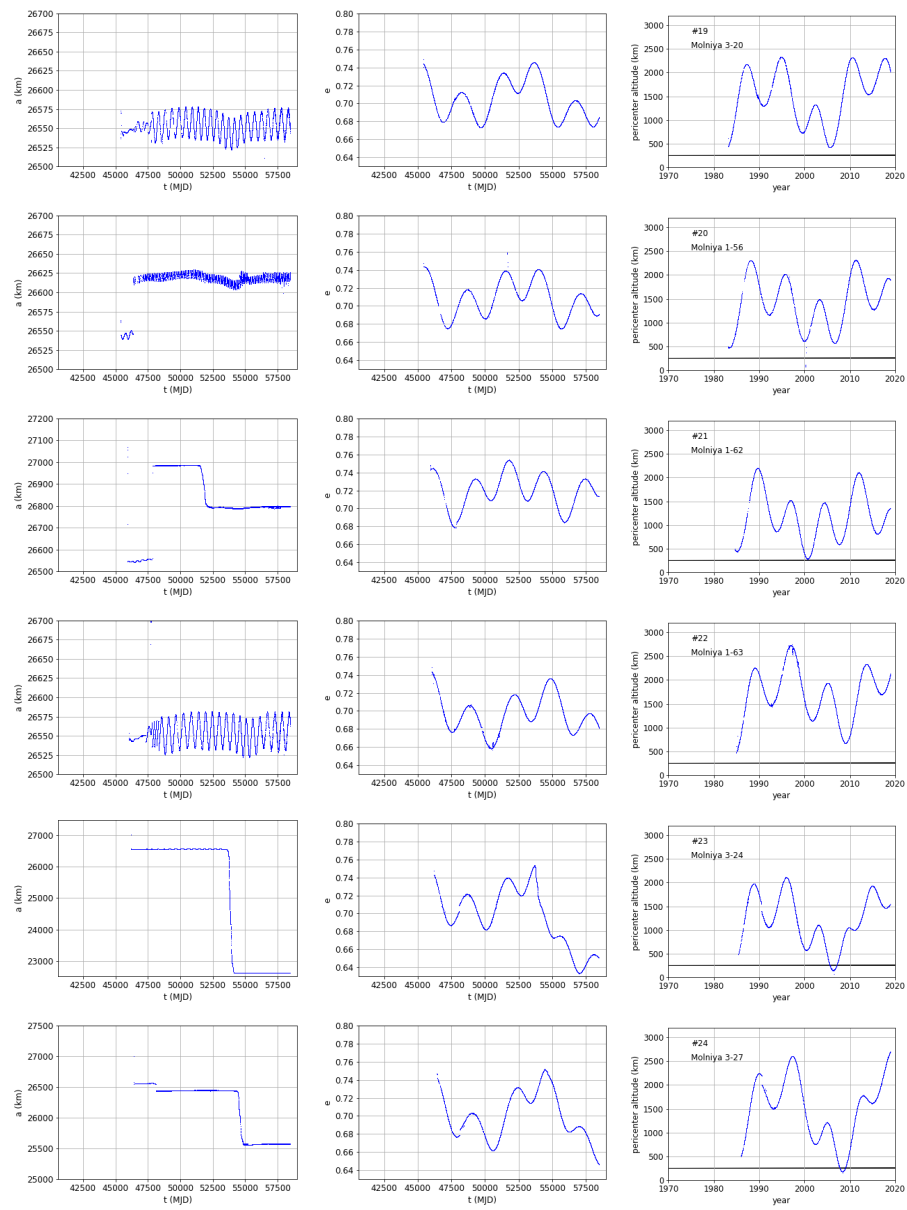


Figure 4

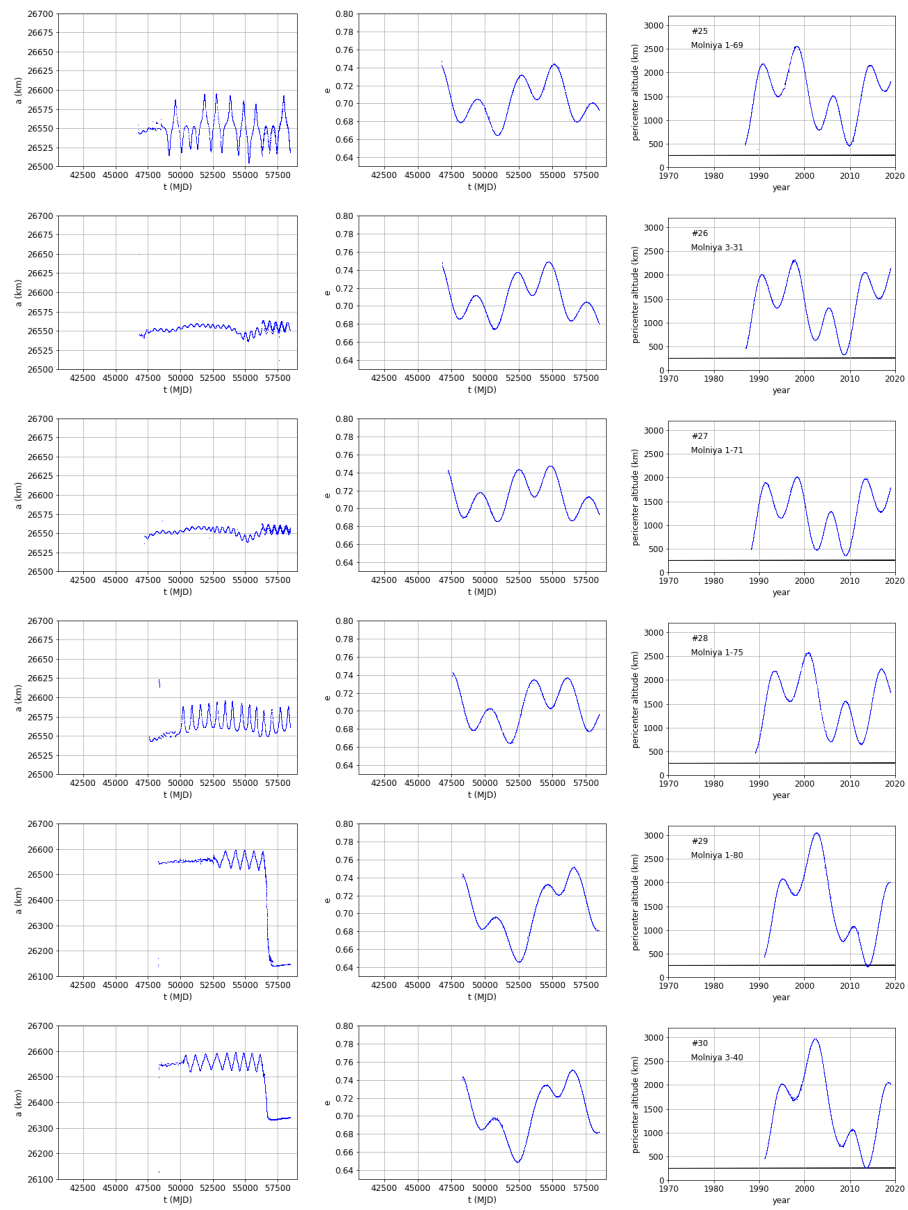


Figure 5

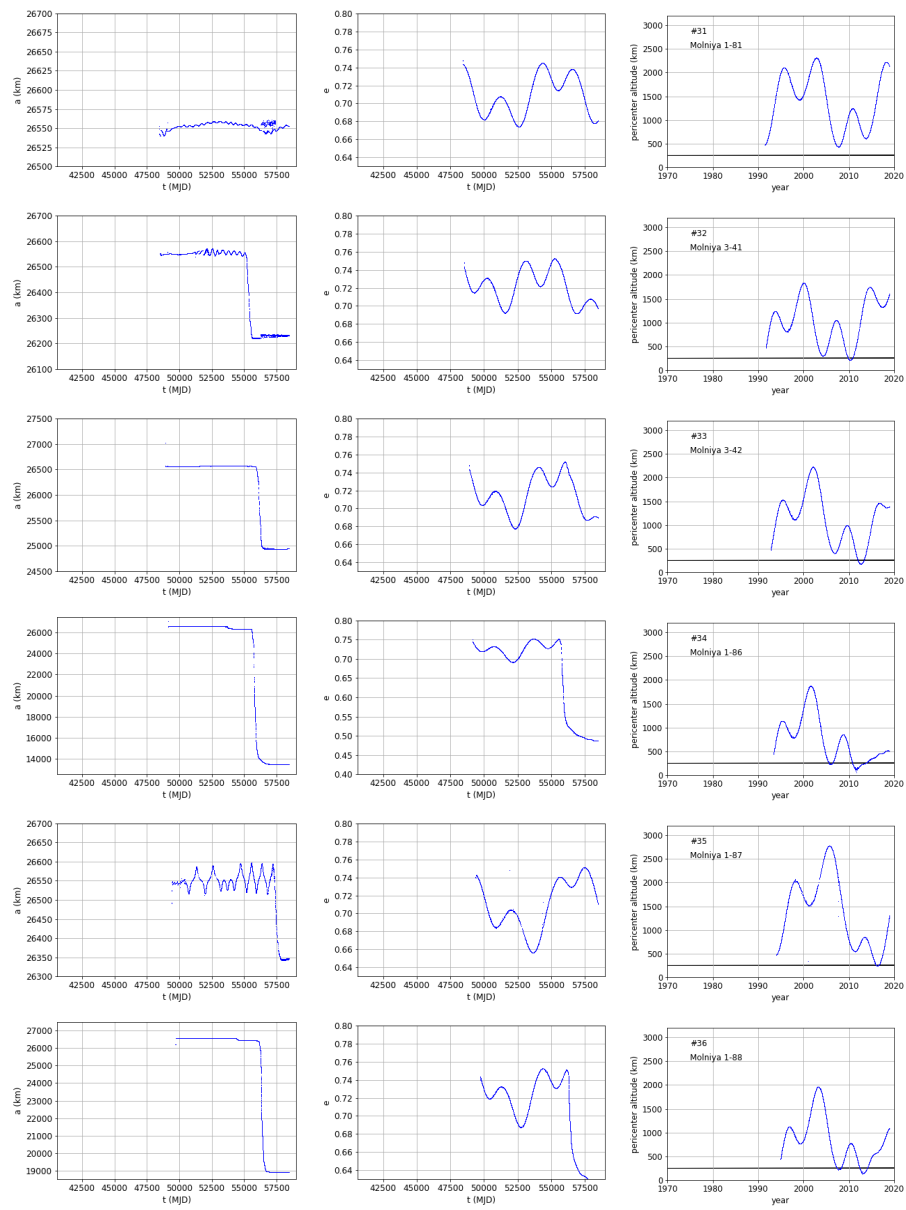


Figure 6

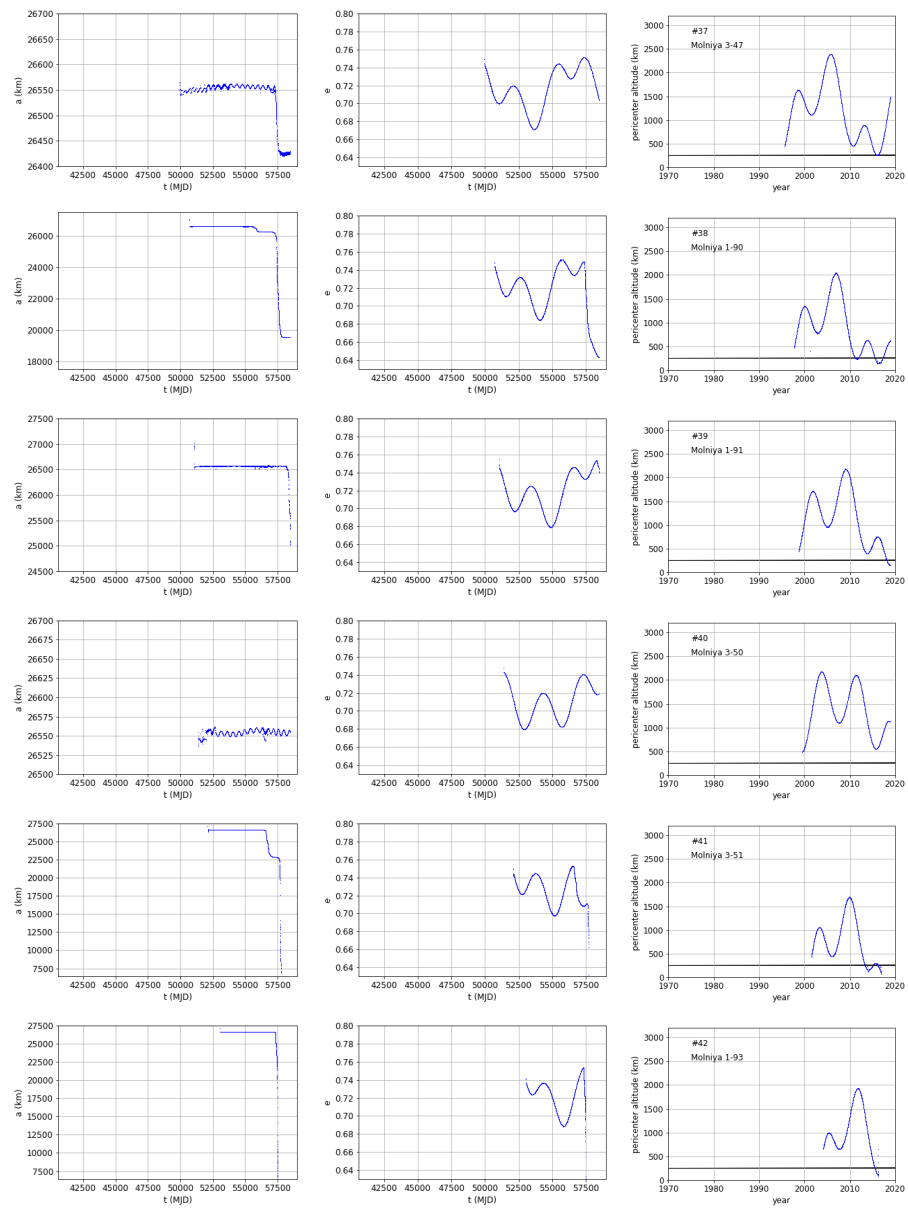


Figure 7